

I claim:

1. A sensor-telemetry system comprising:  
at least one optical sensor;  
at least one non-optical sensor; and  
an optical fiber coupled with the optical sensor and the non-optical sensor and  
being arranged to carry signals outputted from the optical sensor and the non-optical  
sensor.
2. The system of claim 1, wherein the optical sensor comprises an intrinsic  
fiber optic sensor.
3. The system of claim 2, wherein the intrinsic fiber optic sensor comprises a  
fiber Bragg grating.
4. The system of claim 1, wherein the optical sensor comprises one of the  
following: a position sensor, a chemical sensor, a pH sensor, a pressure sensor, a  
temperature sensor, a strain sensor, a refractive index sensor, an acoustic sensor, and a  
magnetic field sensor.
5. The system of claim 1, wherein the non-optical sensor comprises one of  
the following: a flow sensor, pressure gauge, a temperature gauge, a geophone, an  
induction sensor, a current electrode, an acoustic sensor, a micro-electromechanical  
sensor, and a micro-optoelectromechanical sensor.
6. The system of claim 1, further comprising a converter coupling the non-  
optical sensor with the optical fiber.

7. The system of claim 6, wherein the converter comprises an electro-optic device.

8. The system of claim 6, wherein the converter comprises a fiber Bragg grating at least partially encircled by a coating that converts a non-optical signal into a strain on the fiber Bragg grating.

9. The system of claim 1, further comprising a detector coupled with the optical fiber.

10. The system of claim 9, wherein the detector comprises an opto-electronic device.

11. The system of claim 1, further comprising a light source optically coupled with the optical fiber.

12. An oilfield monitoring system comprising:  
 a optical fiber deployed in an oilfield;  
 a plurality of optical sensors coupled with the optical fiber;  
 a plurality of non-optical sensors; and  
 at least one converter coupling at least one of the plurality of non-optical sensors with the optical fiber, wherein the pluralities of optical and non-optical sensors are deployed throughout the oilfield.

13. The system of claim 12, wherein the optical fiber is deployed in a borehole that traverses the oilfield.

14. The system of claim 12, wherein at least one of the plurality of non-optical sensors is positioned remotely from the optical fiber.

15. The system of claim 14, wherein the non-optical sensor positioned remotely from the optical fiber outputs a non-optical signal that travels through the oilfield and is detected by the converter and converted to an optical signal that is coupled to the optical fiber.

16. The system of claim 15, wherein the converter comprises a fiber Bragg grating at least partially encircled by a coating that converts the non-optical signal to a strain on the fiber Bragg grating.

17. The system of claim 12, wherein the converter comprises an electro-optic device.

18. The system of claim 12, further comprising:  
at least one light source coupled with the optical fiber, the light source outputting light that is carried by the optical fiber to at least one of the plurality of optical sensors;  
and

at least one detector coupled with the optical fiber, the detector detecting a signal carried by the fiber optic from at least one of the pluralities of optical and non-optical sensors.

19. The system of claim 18, wherein the light source and the detector reside at the surface of the oilfield.

20. A method of supporting multiple sensors on a optical fiber comprising:

- a) coupling a first optical signal onto the optical fiber, the first optical signal being outputted from an optical sensor;
- b) coupling a second optical signal onto the optical fiber, the second optical signal being derived from a non-optical sensor;
- c) transmitting the first and second optical signals over the optical fiber to a location remote from the fiber optic and non-fiber optic sensors; and
- e) demodulating the first optical signal and the second optical signal at the location.

21. The method of claim 20, wherein the first and the second optical signals are wavelength division multiplexed onto the optical fiber.

22. The method of claim 20, wherein the first and the second optical signals are frequency division multiplexed onto the optical fiber.

23. The method of claim 20, wherein the first and the second optical signals are time division multiplexed onto the optical fiber.

24. The method of claim 20, wherein the non-fiber optic sensor outputs a non-optical signal that is converted into the second optical signal.

25. The method of claim 20, further comprising:

- transmitting a first wavelength of light through the optical fiber; and
- inputting the first wavelength of light to the optical sensor, wherein the optical sensor modifies the first wavelength of light to produce the first optical signal.

26. The method of claim 20, wherein the first optical signal is one of a first plurality of optical signals from a plurality of optical sensors, and the second optical signal is one of a second plurality of optical signals from a plurality of non-optical sensors.

27. The method of claim 26, further comprising:  
transmitting a plurality of wavelengths of light through the optical fiber; and  
inputting the plurality of wavelengths of light to the plurality of optical sensors,  
wherein each optical sensor modifies one of the plurality of wavelengths of light to  
produce one of the first plurality of optical signals.

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